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**Nerve degeneration and bone hypertrophy induced  
 in young animals by diet.** By EDWARD MELLANBY

Some years ago I described destruction of the eighth nerve in young dogs by diets deficient in vitamin A and rich in cereals [Mellanby, 1933]. This destructive change affects the ganglion cells (spiral and Scarpa) of both branches of the nerve and often results in complete deafness of the animals [Mellanby, 1937]. In addition to the nerve degenerative changes, there is overgrowth of bone of the labyrinthine capsule. Bone in the modiolus of the cochlear hypertrophies and causes pressure on the fibres of the eighth nerve; there is also overgrowth of the periosteal bone of the labyrinth capsule at the exit of the internal auditory meatus. This lengthens the distance from the cochlear or vestibule to the brain and so stretches the nerve. Examination of the labyrinthine capsule and its nerves under these conditions suggests that the bone overgrowth is responsible for the nerve degeneration.

On the other hand, nerve degeneration has been shown to be very widespread when young animals are brought up on these diets. Thus many of the afferent nerves of the body, both cranial and somatic, degenerate, as also do ascending tracts in the central nervous system [Mellanby, 1931, 1934, 1935]. The question must be faced whether all these instances of nerve degeneration are due to bone overgrowth and the pressure and stretching of the nerves thus produced. No definite answer can yet be given to this question, but it is undoubted that the bone overgrowth is not confined to the labyrinthine capsule. Examination of the skulls of these animals, for instance, shows other bone abnormalities and it is clear that other nerves are also squeezed by bone overgrowth at the various foramina. This certainly applies to the trigeminal and the facial and possibly to other nerves. Examination of the spinal column for bony overgrowth is being made to see whether the resulting squeezing and stretching may explain degeneration of the somatic nerves.

REFERENCES

- Mellanby, E. (1931). *Brain*, **54**, 247.  
 Mellanby, E. (1933). *Edin. Med. J.* **40**, 197.  
 Mellanby, E. (1934). *Nutrition and Disease*. Oliver and Boyd.  
 Mellanby, E. (1935). *Brain*, **58**, 141.  
 Mellanby, E. (1937). *J. Chem. Ind.* **56**, 1054.

